THE EDUCATION OF HEALTH EXPERTS FOR THE 1970's

John C. Snyder, M.D., LL.D., F.A.P.H.A.

BY tradition an address of this sort begins with a review of the historically important developments including a summary of the notable statements made by outstanding contributors to the subject of the address. The historical approach, however, is not feasible when there is so much to be said about the present and the future. So I now apologize to all those whose works deserve, but will not have recognition, by specific citation.

Over the past 18 years, I have devoted a major part of my energy and thought to the education of experts in public health. As a consequence, I have the firm conviction that changes are urgently needed to assure effective participation of the health professions in accomplishing new social goals. My recommendations relate to three general subjects: population growth and fertility control, prevention of infectious diseases, and innovations in education.

Population Growth and Fertility Control

Other participants in this program[1-3] and the published statements of several recent conferences[4-6] leave no doubt that the populations of many areas of the world are increasing so rapidly that current efforts to improve economic and social conditions seem foredoomed to failure despite the expenditure of funds on a scale never before attempted in history; that success in reducing mortality has not been accompanied by equal progress in improving education, economic conditions or standards of living; and that concerted action is urgently needed to control population growth. In recent years the profession of public health has been called upon to accept responsibility in this area. In 1959 the Governing Council of the American Public Health Association issued an official policy statement[7]:

1. Public health organizations at all levels of government should give increased attention to the impact of population change on health.
2. Scientific research should be greatly expanded on (a) all aspects of human fertility; and (b) the interplay of biological, psychological, and socioeconomic factors influencing population change.
3. Public and private programs concerned with population growth and family size should be integral parts of the health program and should include medical advice and services which are acceptable to the individuals concerned.
4. Full freedom should be extended to all population groups for the selection and use of such methods for the regulation of family size as are consistent with the creed and mores of the individuals concerned.

There are several justifications for expecting the profession of public health to take a central role in population control. First, public health is a mosaic of specialities in medicine, biology, engineering, and the social sciences. It arose because the prevention and control of disease for entire communities and nations demanded a kind of activity which could not be provided by individual physicians performing their traditional role of caring for their patients. Certain diseases could be prevented only by joint action of engineers and physicians in protecting water supplies and food. Other diseases were not controlled until physicians combined their efforts

with those of entomologists, organic chemists, engineers, and community leaders. *The mobilization of experts from the relevant sciences for collaboration with the community and its leaders has become the traditional method of dealing with a public health problem.* Population growth and fertility control constitute a challenge of the first magnitude, a challenge which should now be dealt with by the traditional public health method.

Another consideration is that the immediate task of applying existing knowledge of birth control technics is, in the opinion of many field workers, best accomplished through local organizations already providing health services and medical care, especially the clinics for maternal and child health. In most of the places where birth control programs can be started soon, it is probable that the local health agencies will be designated to develop and supervise the work.

Although some attention has been paid to the 1959 policy statement by the American Public Health Association, far too little has been done to involve the health professions in population control. I believe that the State and Provincial Health Authorities of North America, the American Public Health Association and its Committee on Professional Education should join with the men and women who are in the forefront of administering health organizations, both governmental and voluntary, in attaining a far broader acceptance of responsibility by health agencies for direct involvement in the search for locally acceptable solutions to problems of population growth and fertility control. Not tomorrow, now!

Equally important are the steps that should be taken by schools of public health and their parent universities. They should meet their responsibilities in the area of population problems by mobilizing the resources needed for the traditional academic functions of advancing and spreading knowledge. The faculties of public health should take the lead in organizing research and field work in the population area, and should coordinate the efforts of experts from relevant disciplines in the attack on population problems, both immediate and remote. Furthermore, faculties of public health should give first priority to the rapid development of new courses of instruction and new programs combining academic work and supervised field experience, especially designed to prepare their graduates for active participation in the control of human fertility.

By stating that such new programs should be accorded first priority, I mean specifically that these efforts should be under way now, in October, 1964. An argument is sometimes advanced in opposition to the idea of undertaking instruction on population problems, namely, that not enough is known to justify the attempt to design a curriculum for population officers or for population research workers. In my opinion, this argument has appeal only to the academic perfectionist. Let us agree that the first results of new educational programs on population problems may fall short of high academic standards. But we may also agree that the experience gained from the first attempts will provide the basis for strengthening and improving the instruction. Furthermore, the concurrent involvement of the university faculties in research will soon provide new knowledge that can be included in the courses of instruction on population problems.

What kinds of courses should the schools of public health offer? In this initial phase, it seems to me, there should be instruction in subjects such as human reproduction and fertility control, factors affecting population growth in different regions and societies, technics of demographic and statistical

analysis, and critical reviews of control programs and campaigns.

My next point is that, in the curricula of schools of public health, basic instruction in population growth and fertility control should be accorded equal emphasis with the traditionally required subjects relating to the principles of environmental health, administration, epidemiology, biostatistics and communicable disease control. I believe that the faculties of public health on the one hand, and the leaders of the profession of public health on the other, should insist that men and women who enter the health professions have the basic knowledge of factors affecting population growth and fertility control. Vigorous endorsement of this position by the Committee on Professional Education of the American Public Health Association will greatly facilitate the inclusion of new instruction on population problems in the required curricula of schools of public health, not only for candidates for the degree of master of public health, but also for candidates for other degrees in public health.

Parallel to the development of new instruction in the schools of public health, there should be a deliberate and sustained effort to present to the ablest young men and women in our colleges and universities the full scope and depth of the intellectual challenge posed by population problems. Surely, the intricacies of achieving a change in the motivation of individuals and families in the face of deeply entrenched cultural patterns are as subtle and as elusive as the complexities of determining the functions of DNA and RNA in living cells—perhaps even more subtle and elusive.

Intellectual curiosity and competence of a high order are needed. In order to attract able and highly motivated students into the population field as a career, the faculties of public health will need to assign their most skillful teachers and their most gifted research workers to the preparation of new courses of instruction and the launching of new programs of research.

Prevention of Infectious Diseases

This subject is important in its own right and in its relation to success in population control. The latter association is widely misunderstood and I shall return to this point.

One of the brightest prospects for progress in the quest for health lies in research on infectious diseases of man. Infectious agents have become prime suspects among possible causes of several serious diseases previously assumed to be noninfectious, diseases of major public health importance in the highly industrialized nations. That certain forms of cancer, mental illness, and diseases of old age may prove to be preventable has been underscored by recent discoveries. One can cite evidence such as the simian virus which can alter human cells in tissue culture and produce neoplasms in animals,[8] the role of the cytomegaloviruses in causing mental retardation,[9] and the fatty degeneration induced by the lipovirus in human cells in continuous culture.[10] Very definitely, the surface has been scratched, but new vistas of knowledge await the skilled scientists who are investigating the role of infectious agents in the chronic, degenerative, and neoplastic diseases of man.

Emphasis on infectious diseases has other justifications. The public pronouncements by eminent people to the effect that infectious diseases have been conquered are, unfortunately, quite inaccurate and misleading. The process of evolution has not stopped. The generation times of microorganisms are measured in minutes not in decades. The rapid emergence of genetically altered drug-resistant strains of microbial pathogens and of pesticide-resistant dis-

ease-transmitting arthropods can be cited to illustrate this important point. More than 100 viruses hitherto unknown have been recognized in the past few years as pathogenic for man. Furthermore, the Cleveland family study[11] strikingly emphasizes the importance of infectious disease in technologically advanced urban societies today. The diseases occurring in members of families were recorded and observed over a period of years, whether or not hospitalization was required. The Cleveland study revealed an average of ten illnesses per person per year with about 60 per cent of these being respiratory illnesses, almost certainly infectious, and from 10 to 20 per cent gastrointestinal, probably infectious. It was concluded that infectious disease accounted for more than half of the considerable amount of illness that took place in this cross-section of American city dwellers receiving medical care of high quality by contemporary standards.

Moreover, infectious diseases are among the leading causes of death and disability for more than half the total population of the world. Carriers of disease, whether they are citizens returning home or foreigners coming for short visits, can come to the major cities of the world by aircraft flights which are shorter in time than the incubation period of most of the infectious diseases. The populations of the technologically advanced nations tend to lack immunity to the many infections which abound in the poorly sanitated areas of the world.

From the point of view of the United States the increased foreign involvement of our country for reasons of trade, defense, diplomacy, and technical assistance has led to the estimate that a considerable percentage of all American college graduates in the foreseeable future will spend a portion of their lives at work abroad. The hazards to our health as a consequence of such assignments abroad are increased by the scarcity of qualified physicians in many of the underdeveloped areas and by the lack of experience of American physicians with the infectious diseases common to the poorly sanitated regions. Thus there is cause for serious concern in the fact that the training of physicians in the United States today does not prepare them adequately to deal with infectious diseases acquired abroad.

A further reason for renewing the emphasis on prevention of infectious diseases lies in the fact that as a consequence of the flood of new knowledge, the responsibility for preparing skilled people in this field is shifting from the professional schools of medicine, veterinary medicine and nursing, to the graduate schools of public health. While students in the basic courses of the professional schools are being familiarized with more and more of the newer subjects such as molecular biology and biophysics, they are receiving less and less instruction in diagnosis, treatment, and prevention of infectious diseases. Our nation must increasingly depend on its schools of public health to provide the postgraduate instruction to physicians and other members of the health professions so that they will acquire a thorough understanding of infectious disease in man and will be able to deal intelligently with community and national programs for reducing this major cause of human suffering, disability, and death.

To return now to the association between population control and infectious diseases. Some of the authorities responsible for allocation of funds intended for the assistance of the newly emerging nations are believed to have taken the view that investment of funds for improvement of health facilities has reduced death rates and thereby aggravated the serious problems of overpopulation. Therefore, they argue, we must not invest any further funds in disease

control until fertility control has been accomplished. This view is entirely contrary to the basic precepts of our civilization. It is morally and ethically wrong to refuse to prevent illness and death among the underprivileged populations when the necessary knowledge and the resources are at hand. But even if we exclude humanitarian considerations, there is strong justification for investment in programs for prevention of disease and improvement of health, from two viewpoints: first, on the basis that economic development will proceed more surely and swiftly if the community and its labor force are strong and healthy, not debilitated and rendered apathetic by disease; and second, on the basis that fertility control measures will be more rapidly accepted by a healthy population. A few remarks are in order to put the latter point into sharper focus.

The inducements which can be offered in the effort to persuade semiliterate or illiterate people to restrict the births in their families are wholly ineffective when the mothers and fathers, through the long experience of their people, are convinced that many of the infants born to their families will succumb in infancy and childhood to diseases such as smallpox, tuberculosis, dysentery, and pneumonia. The only provision for the care of the elderly and the infirm in some societies is the existence of families wherein enough children survive the diseases of childhood to take care of their parents and grandparents in old age. It will not be possible to succeed in persuading such people to limit their pregnancies while they fear that most of the infants born to them will not survive to adulthood. Reduction of mortality rates in infancy and childhood will prepare a population psychologically to reduce fertility with the result that the total growth of that population will soon be less rapid than it would have been if fear of losing their children continued to prevail. This is a powerful argument for striving just as vigorously for the prevention of infectious diseases as for the control of fertility, both being essential to the program from improving the general health and well-being of mankind.

Such are the considerations which persuade me to urge that the schools of public health accept full responsibility for improving and expanding their curricula on subjects relevant to the prevention of infectious diseases, both for the foreign as well as the American students who will be the practitioners of public health, the teachers, and research workers in the 1970's.

Innovations in Education

It can be noted with considerable satisfaction that the quality of the collegiate and professional education received by the men and women who are now arriving for matriculation in schools of public health is generally superior to that of two decades ago. As in the past there are a few truly excellent students at the top of each new group, but the important change is that the lower end of the group is far better prepared today than was the case two decades ago. This is a tribute to the colleges and universities which have upgraded requirements, standards of performance, and quality of instruction. Schools of public health must now move in the same direction, and without delay. This conclusion is reached even more decisively from another viewpoint.

The rate of change in many matters affecting our lives is increasing almost exponentially. A moment of reflection is enough to evoke deep concern over the increasing complexities of urban life and the flood of technological advances now affecting the highly industrialized societies. These changes will soon impinge upon the new nations which are determined to leap into ad-

vanced economic status in a decade or less. But of particular relevance to our subject, education, is the extraordinary increase in the amount of knowledge which is literally flooding the libraries. In 1941 approximately 500 journals arrived in the major medical libraries of this country, journals dealing with the sciences directly contributing to medicine and public health. In 1965 the number will be at least 2,500, an increase of fivefold in this short span.[12] The National Library of Medicine expects to receive 16,000 journal issues this year, with a total number of articles related to the health sciences numbering approximately 160,000.[13] Zinsser has analyzed certain phases of the impact of technology on medicine.[14] He notes that there are approximately 2,000 diseases with which every physician should be thoroughly familiar; furthermore, that there are 90,000 items of factual information currently being taught in an American medical school. In his opinion "this number should be increased by a factor of five to encompass the actual bits of information likely to be present, concealed beneath these titles and subheadings."[14, p. 917] Whether the total number is 90,000 or 450,000, the mass of facts being presented to the medical student is awesome indeed.

These are the figures of today—several multiples larger than the figures of two decades ago. If data were available for the health sciences other than medicine, I think there would be similarly striking increases in the volume of information. In the foreseeable future it is probable that the rate of accumulation of new knowledge will continue to accelerate. Unless the length of time allotted for the education of practitioners, teachers, and research personnel is greatly extended, which seems neither feasible nor acceptable, the conclusion is inescapable that the educational process itself must be vastly improved. Otherwise the health sciences and professions will fall far behind their potential for public service in the future. The danger is real, and is clearly described by John Gardner in his book "Self Renewal: The Individual and the Innovative Society":

> "We are witnessing changes so profound and far-reaching that the mind can hardly grasp all the implications . . A society that has reached heights of excellence may already be caught in the rigidities that will bring it down. An institution may hold itself to the highest standards and yet already be entombed in the complacency that will eventually spell its decline . . Unless we foster versatile, innovative, and self-renewing men and women, all the ingenious social arrangements in the world will not help us."[15, pp. xiii-xvi]

It is the responsibility of policymakers in education for the health professions (a) to accept the fact that many facets of contemporary systems of instruction are outmoded and inadequate; (b) to concentrate their best resources and their wisest minds on an intensive search for more effective educational technics, and (c) to have the courage to experiment even though some of the experiments may be failures. Again, Gardner has stated this succinctly:

> "We pay a heavy price for our fear of failure. It is a powerful obstacle to growth. It . . . prevents exploration and experimentation. There is no learning without some difficulty and fumbling. If you want to keep on learning you must keep on risking failure—all your life."[15, p. 15] "An organization may avoid experimental ventures because it fears to damage its reputation for soundness. . . . Many an established specialist fears the loss of his reputation if he ventures beyond the territory where he has proved his mastery. Indeed this fear is the greatest obstacle to intellectual breadth in the scholarly world."[15, p. 52]

In conclusion I wish to stress my conviction that the intellectual challenge of careers in public health has *not* been presented clearly enough to the students in our colleges and universities. Dr. Weller in his essay on

"Questions of Priority"[16] gave emphasis to this point:

"There is little general appreciation of the breadth, vitality and social significance of modern public health—or of the intellectual stimulus inherent in a rapidly evolving process of synthesis and integration of knowledge wherein medicine and the biologic sciences, the social sciences and the physical sciences meld for the benefit of man."

The schools of public health will accomplish two purposes if they move swiftly now to make their curricula more effective and more challenging to the able and well-prepared university graduates: they will attract the men and women who are gifted in administration, policy formation, education, and research; and in the process they will also attract the innovators who are citizens of crucial importance to our future.

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Dr. Snyder is dean of the Faculty of Public Health and Henry Pickering Walcott professor of public health, Harvard University School of Public Health, Boston, Mass.

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